

A new species of *Caloapenesia* from Vietnam, with discovery of the female of the genus

(Insecta, Hymenoptera, Bethyridae)

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Caloapenesia brevis, spec. nov. from Vietnam is described and illustrated. The female of the genus is described for the first time. A key to males is presented.

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Introduction

Caloapenesia Terayama, 1995, belongs to the world-wide distributed subfamily Pristocerinae, which has 17 extant and four extinct genera (Terayama 1996) and about 500 nominal species. The genera *Dissomphalus* Ashmead, 1893, *Pseudisobrachium* Kieffer, 1904, and *Apenesia* Westwood, 1874 are the most speciose. Most of the genera of Pristocerinae have fewer than 10 species and are restricted to only one zoogeographic region. *Caloapenesia* is a small genus with two previous described species confined to the eastern Oriental region. They are *C. thailandiana* Terayama, 1995, from Thailand and *C. philippinensis* Terayama, 1995, from the Philippines, which were described based only on the male, holotype specimens, deposited at the Provincial Museum of Alberta in Edmonton, Canada. In this study I describe a third species of *Caloapenesia* from Vietnam based on both sexes, the female being the first recorded for the genus.

Methods

The measurements and indices used in this study are as follows: LH, head length, measured in frontal view, from the crest of the vertex to the median apical margin of the clypeus; WH, head width, measured in frontal view, its

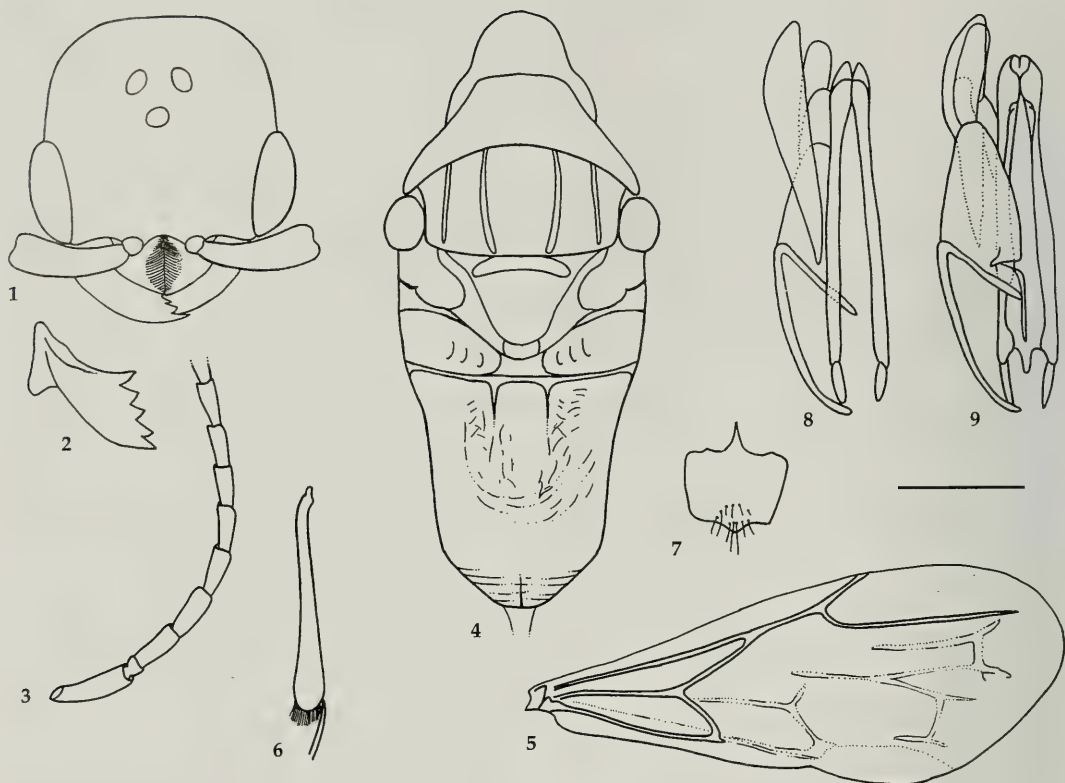
maximum width including the eyes; WF, width of frons, measured in frontal view, its minimum width, usually about the bottom of the eyes; HE, height of eye, measured in lateral view, its maximum height (length); OOL, ocello-ocular line, measured in laterodorsal view, the shortest distance from the eye top to the posterior ocellus; WOT, width of the ocellar triangle, measured in frontal view, the maximum width, including the ocelli; DAO, diameter of anterior ocellus, measured in frontal view; shortest distance of the posterior ocelli to the crest of the vertex, measured in posterodorsal view; VOL, vertex-ocular line, measured in lateral view, the distance from the top of the eye to vertex crest.

Terminology generally follows Evans (1964) and Azevedo (1999). The nomenclature of integument sculpture follows Harris (1979).

Caloapenesia Terayama, 1995

Type species: *C. thailandiana* Terayama, 1995 by original designation.

Diagnosis. Male. Mandible broad apically, palpal formula 6:3, clypeus projected medially, eye with long hairs between facets, ocelli large, notauli and parapsidal furrows present, propodeal disc elongate and without median and transverse carinae, hind tibial spurs subequal in length, metasoma sessile, forewing without stigma, costal vein obscure to



Figs 1-9. *Caloapenesia brevis*, spec. nov. 1. Head, dorsal. 2. Mandible, frontal. 3. Antenna, frontal. 4. Mesosoma, dorsal. 5. Forewing, dorsal. 6. Hind tibia, posterior. 7. Hypopygium, dorsal. 8. Genitalia, ventral. 9. Genitalia, dorsal. (Scale bar = 0.5mm for figs 1, 2, 4, 5 and 7; = 1 mm for fig. 3; = 0.3mm for figs 8 and 9).

absent, discoidal veins arising well down on transverse median vein, hypopygium only with median stalk, genitalia with each paramere deeply divided in two arms.

Female. Palpal formula is 5:3, multifaceted eyes, triangular mesoscutum, mesopleuron large in dorsal view, constricted propodeal disc anteriorly.

Recognition. This genus is easily distinguished from the other genera of Pristocerinae by the costal cell very long, extending beyond the origin of the radial vein, and forewing stigma absent.

Caloapenesia brevis, spec. nov.

Figs 1-15

Types. Holotype: ♂, allotype ♀ and 3 paratypes 3♂, VIETNAM, Ha Tinh, Huong Son, 1240 m, 18°22'N 105°30'E, 20.v.1998, M[alaise] T[rap], leg. L. Herman.

Type repository. Holotype, allotype and 1 paratype at American Museum of Natural History, New York, U.S.A., 1 paratype at Canadian National Collection of

Insects, Ottawa, Canada and 1 paratype at Universidade Federal do Espírito Santo, Vitória, Brazil.

Etymology. The specific epithet *brevis* (Latin = short) refers to the short pedicel compared to the pedicel of the other species of the genus.

Description

Male. Body length 6.93 mm, forewing length 4.46 mm. Color. Head, clypeus and mesosoma black, antennae dark castaneous, mandibles, palpi, tegulae, wing veins, legs and metasoma castaneous, wings subhyaline.

Head (Fig. 1). Mandibles with five large, sharp teeth, equal in length (Fig. 2). Clypeus with a rounded median lobe, distinctly projecting, median tooth directed downward, not visible in dorsal view, median carina very high and arched in profile. First four antennal segments in ratio of 22:4:15:14; pedicel short, 0.8× as long as its diameter (Fig. 3), segment XI 2.93× as long as its diameter, pubescence erect and suberect, slightly shorter than the diameter of the antennomeres. Eyes small, hairy, with

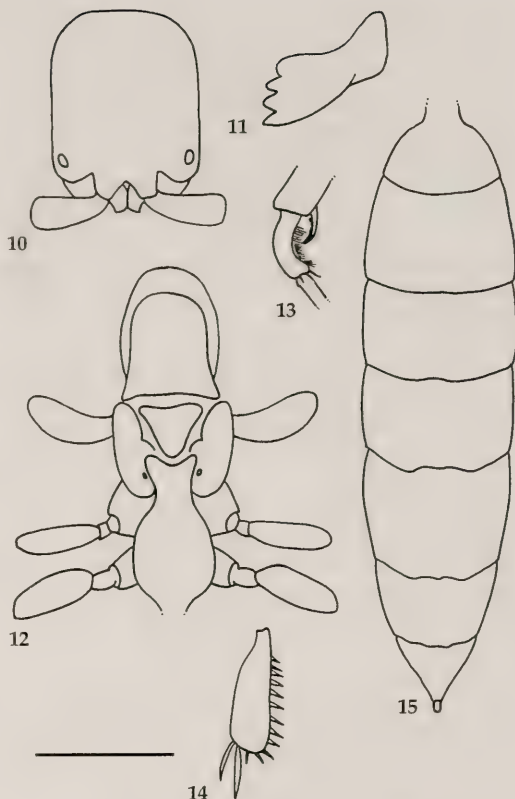
inner margins convex. Frons polished, densely punctured, deeply excavated beside toruli and strongly produced at insertion of mandibles. WH $0.96 \times$ LH; WF $0.72 \times$ WH; DAO $0.14 \times$ WF, WF $1.64 \times$ HE; OOL $1.23 \times$ WOT; posterior ocellus distant from crest of vertex $2.0 \times$ DAO, frontal angle of ocellar triangle acute. Vertex straight, with rounded corners. VOL $0.91 \times$ HE. Temples parallel. Genae with punctures large, shallow and subcontiguous. Occipital carina absent on the ventral side. Hypostomal carina very thickened medially.

Mesosoma (Fig. 4). Thorax as strongly punctate as frons, except impunctate areas of posterior band of pronotal disc, median line of scutellum and callus of mesopleuron; punctures of mesoscutum smaller. Pronotal disc short. Notauli complete, well impressed and converging posteriorly. Parapsidal furrows complete, well impressed and parallel. Scutellar groove deep, wide and with transverse ridges inside. Mesopleuron with a small callus. Propodeal disc $0.89 \times$ as wide as long, without median, lateral and posterior carina, the latter replaced by a longitudinal band of punctures, basal triangle striate, disc polished at posterior corners, declivity polished and strongly punctate, without median carina, side-pieces of propodeum polished and impunctate. Forewings (Fig. 5) with costal cell extending further than from where radial vein arises, slightly narrower than submedian cell, costal vein obscure distally, metacarpus $0.27 \times$ as long as radial vein, which extends nearly to distal margin of wing. Middle tibia with some spines. Hind tibia with a conspicuous curved fringe of hairs in the posterior face on the distal margin and spurs about $0.5 \times$ as long as hind basitarsi (Fig. 6). All claws with two long, sharp teeth.

Metasoma. Sessile, polished with coriaceous transverse bands, punctures small. Hypopygium with posterior margin convex, anterior stalk $0.31 \times$ as long as plate (Fig. 7). Genitalia (Figs 8-9): paramere divided in two arms, both arms with horizontal surface, dorsal arm arising close to genital ring, with dorsal margin straight and ventral margin convex, ventral arm $0.42 \times$ as long dorsal arm, evenly wide with rounded apex, volsella with cuspis dome-shaped, with some shallow grooves, digitus with some small denticles on dorsal margin, basivolsella excavated below; aedeagus higher than cuspis, slender, with a pair of rounded and somewhat gibbous apical lobes.

Female. Length of body 6.78 mm. Color: Head, clypeus, scape and mesosoma black, antennae, mandibles, legs and metasoma dark castaneous, palpi castaneous, eye gray.

Head (Fig. 10). Weakly coriaceous, punctures



Figs. 10-15. *Caloapenesia brevis*, spec. nov. 10. Head, dorsal. 11. Mandible, frontal. 12. Mesosoma, dorsal. 13. Fore tarsus, lateral. 14. Median tibia, lateral. 15. Mesosoma, dorsal. (Scale bar = 0.5 mm for figs 11, 13 and 14; = 1 mm for figs 10, 12 and 15).

large, separated by about $1-3 \times$ their diameters. Mandible with four conspicuous teeth (Fig. 11). Palpal formula 5:3. Clypeus with trapezoidal median lobe, being apical margin emarginated, median carina high, almost angled in profile and divided in two apically. First four antennal segments in ratio of 5:1:1:1, flagellomeres wider than long, except the last, sensilla elongate, whitish, denser on flagellomeres V-XI, toruli long, tubular, slightly directed out and downward. Frons excavated beside each torulus. Eye subcircular with 16 small facets (right eye), ocelli absent. LH $1.43 \times$ WH, sides of head straight, barely diverging anteriorly. Vertex straight, its corners broadly rounded. Occipital carina complete. Hypostomal carina thicker medially.

Mesosoma (Fig. 12). Weakly coriaceous, punctures as for frons, except impunctate areas of median line of pronotal disc, anterior half of propodeal disc, ventral half of declivity and side-pieces of propodeum. Pronotal disc, mesoscutum and propodeal

disc in a ratio of about 2:1:2, with a deep and wide suture separating pronotal disc and mesoscutum. Pronotal disc longer than wide. Mesoscutum triangular, slightly embraced by anterior margin of propodeum. Mesopleuron large in dorsal view, more projected anteriorly. Propodeal disc very constricted anteriorly, with maximum width at posterior slope $3.18 \times$ minimum width beyond the spiracles, which are slightly directed outward. Tegulae and wings absent. Front femur $2.57 \times$ as long as thick. Front basitarsus strongly curved (Fig. 13). Middle tibia strongly spinose (Fig. 14). All claws long and simple.

Metasoma. Sessile, polished, subcircular in cross section, $0.52 \times$ length of body, posterior margins of tergites III-VI slightly concave medially (Fig. 15).

Key to the males of *Caloapenesia*

- 1. Head longer than wide, anterior ocellus not reaching level of top of eye in dorsal view (Fig. 1); pedicel at most $0.5 \times$ as long as flagellomere I (Fig. 3) 2.
- Head as long as wide, anterior ocellus surpassing level of top of eye in dorsal view (Terayama 1995, fig. 6); pedicel at least $0.5 \times$ as long as flagellomere I (Terayama 1995, fig. 8) *C. philippinensis* Terayama, 1995
- 2. Pedicel wider than long, about $0.25 \times$ length of flagellomere I, each flagellomere wider at apex than at base (Fig. 3); aedeagus slender, dorsal arm of paramere slightly shorter than ventral arm (Figs 7, 8) *C. brevis*, spec. nov.
- Pedicel longer than wide, about $0.5 \times$ length of flagellomere I, each flagellomere evenly wide; aedeagus wider than above, dorsal arm of paramere as high as ventral arm (Terayama 1995, fig. 3) *C. thailandiana* Terayama, 1995

Discussion

Caloapenesia was described by Terayama (1995) to place two species of Pristocerinae whose forewing has no stigma. This third species of *Caloapenesia* is distinctive by the pedicel very short and the flagellomeres wider apically. It also has a conspicuous band of hairs on the distal margin of hind tibia.

The female of *Caloapenesia* with multifaceted eyes, triangular mesoscutum, constricted propode-

al disc anteriorly and mesopleuron large in dorsal view runs to *Pristocera* Klug, 1808 and *Acrepyris* Kieffer, 1905, but the palpal formula is 5:3 in the former and 6:3 in the latter. Females of *Caloapenesia* differ from *Pseudisobrachium* because its females have eyes with a single facet and elongate mesoscutum. They also differ from *Dissomphalus* because females of *Dissomphalus* have a transverse mesoscutum, propodeal disc evenly wide or nearly so and mesopleuron not expanded laterally. Although females of *Apenesia* have a triangular mesoscutum and expanded mesopleuron as in females of *Caloapenesia*, they do not have an anterior constriction in propodeum. Terayama (1996) provided a cladogram of the extant genera of Pristocerinae based on 49 characters of males only, and according to it, *Caloapenesia* is more closely related to *Pseudisobrachium* and *Dissomphalus* than *Pristocera* and *Acrepyris*. He did not use females in the analysis because few genera have known females. A cladistic analysis of Pristocerinae including both males and females might indicate that *Caloapenesia* is closely related to *Pristocera* and *Acrepyris*. This points out that females are important to the systematics of the group even though they are poorly known and rarely collected.

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